CLAIM AMENDMENTS

Claims 1-90 (canceled)

112. (currently amended) An *in vitro* process for producing more than one copy of a nucleic acids of interest, said process comprising the steps of:

(a) providing a nucleic acid sample containing said nucleic acids of interest;

(b) contacting said sample with a mixture comprising: (i) nucleic acid precursors; (ii) one or more specific polynucleotide primers comprising at least one ribonucleic acid segment, each of which primer comprises a sequence complementary to a distinct sequence of said nucleic acids of interest; (iii) an effective amount of a nucleic acid producing catalyst; and (iv) RNase H; ~~and~~

(c) carrying out nucleic acid synthesis to produce a polynucleotide comprising an RNA/DNA hybrid, thereby generating a substrate for RNase H;and

(d) digesting said substrate with RNase H to remove said ribonucleic acid segment of said primer and allow another primer binding event to occur with said nucleic acid of interest, thereby producing multiple copies of said nucleic acids of interest.

113. (previously presented) The process of claim 112, wherein said primers (ii) comprise modified nucleotides, unmodified nucleotides or a combination thereof,

114. (previously presented) The process of claim 112, wherein said primers (ii) comprise sequences noncomplementary to said distinct sequence of said nucleic acids of interest.

115. (previously presented) The process of claim 114, wherein said primers (ii) comprise from about 1 to 200 noncomplementary nucleotides or nucleotide analogs.

116. (previously presented) The process of claim 112, wherein said primers (ii) further comprise deoxyribonucleotides,

117. (previously presented) The process of claim 112, wherein said nucleic acid producing catalysts (iii) comprise DNA polymerase, RNA polymerase, reverse transcriptase or a combination thereof.

118. (previously presented) The process of claim 117, wherein said DNA polymerase comprises E. coli DNA polymerase I, Klenow polymerase, polymerases derived from thermophilic bacteria or a combination thereof.

119. (previously presented) The process of claim 118, wherein said polymerases derived from thermophilic bacteria comprise Taq DNA polymerase.

120. (previously presented) The process of claim 112, wherein said mixture recited in step (b) comprises nucleic acid precursors, one or more specific labeled polynucleotide primers, or a combination of both.

121. (previously presented) The process of claim 112, wherein said primers (ii) contain a 3'-hydroxyl group or an isosteric configuration of heteroatoms.

122. (previously presented) The process of claim 121, wherein said heteroatoms comprise nitrogen or sulfur.

123. (currently amended) A process for multiply initiating polynucleotide or oligonucleotide synthesis of a nucleic acid of interest comprising:
(a) providing a sample containing said nucleic acids of interest;
(b) contacting said sample with a mixture comprising: (i) nucleic acid precursors; (ii) one or more specific copolymer primers comprising at least one DNA segment and at least one RNA segment, each of which primer comprises a sequence complementary to a distinct sequence of said nucleic acid of interest; (iii) an effective amount of a nucleic acid producing catalyst; and (iv) RNase H; and
(c) producing at least one copy of said nucleic acid of interest by using said nucleic acid producing catalyst (iii) and said nucleic acids of interest as templates; and

(d) removing said RNA segment of said primer from said template by digesting with RNase H to bind another primer to said template and initiate synthesis, thereby multiply initiating polynucleotide or oligonucleotide synthesis.

124. (previously presented) The process of claim 123, wherein said primers comprise modified nucleotides, unmodified nucleotides or a combination thereof.

125. (previously presented) The process of claim 123, wherein said primers further comprise sequences that are noncomplementary to said distinct sequence of said nucleic acids of interest.

126. (previously presented) The process of claim 125, wherein said primers comprise from about 1 to 200 noncomplementary nucleotides or nucleotide analogs.

127. (previously presented) The process of claim 123, wherein the nucleic acid producing catalyst (iii) comprises DNA polymerase, RNA polymerase, reverse transcriptase or a combination thereof.

128. (previously presented) The process of claim 127, wherein said DNA polymerase comprises E, coli DNA polymerase I, Klenow polymerase, polymerases derived from thermophilic bacteria or a combination thereof.

129. (previously presented) The process of claim 128, wherein said polymerases derived from thermophilic bacteria comprise Taq DNA polymerase.

130. (previously presented) The process of claim 123, wherein said mixture recited in step (b) comprises nucleic acid precursorsl one or more specific labeled polynucleotide primers or a combination of both.

131. (previously presented) The process of claim 123, wherein said primers contain a B-hydroxyl group or an isosteric configuration of heteroatoms.

132. (previously presented) The process of claim 131, wherein said heteroatoms comprise nitrogen or sulfur.

133. (currently amended) An in *vitro* process for producing more than one copy of RNA of interest, said process comprising the steps of:
(a) providing a nucleic acid sample containing said RNA of interest;
(b)contacting said sample containing with a mixture comprising: (i) nucleic acid precursors; (ii) one or more polynucleotide primers wherein said primers comprise (A) at least one ribonucleic acid segment and (B) a sequence complementary to a distinct sequence in said RNA of interest; (iii) an effective amount of a nucleic acid producing catalyst; and (iv) RNase H;
(c) producing at least one DNA copy from said RNA of interest;
(d) using said DNA copy as a template to produce a double-stranded copy comprising a second copy complementary to said DNA copy produced in step (c); and
(e) removing said ribonucleic acid segment of said primers with RNase H from said double-stranded copy produced in step (d) to regenerate a primer binding site on said template of (c)~~, thereby allowing a new priming event to occur~~ to render said primer binding site available for subsequent primer binding events and producing more than one copy of said RNA of interest.

134. (previously presented) The process of claim 133, wherein said primers (ii) comprise modified nucleotides, unmodified nucleotides or a combination thereof.

135. (previously presented) The process of claim 133#wherein said primers (ii) further comprise sequences noncomplementary to said distinct sequence of said RNA of interest.

136. (previously presented) The process of claim 135, wherein said primers (ii)further comprise from about 1 to 200 noncomplementary nucleotides or nucleotide analogs.

137. (previously presented) The process of claim 133, wherein said primers (ii) further comprise deoxyribonucleotides.

138. (previously presented) The process of claim 133, wherein said nucleic acid producing catalysts (iii) comprise DNA polymerase, RNA polymerase, reverse transcriptase or a combination thereof.

139. (previously presented) The process of claim 133, wherein said DNA polymerase comprises E. coli DNA polymerase I, Klenow polymerase, polymerases, derived from thermophilic bacteria, or a combination thereof.

140, (previously presented) The process of claim 133, wherein said polymerases derived from thermophilic bacteria comprise Taq DNA polymerase.

141. (previously presented) The process of claim 91 wherein said mixture recited in step (b) comprises nucleic acid precursors, one or more specific labeled polynucleotide primers or a combination of both.

142. (previously presented) The process of claim 141 wherein said primers comprise from about 1 to 200 noncomplementary nucleotides or nucleotide analogs.

143. (new) An in vitro process for producing more than one copy of a specific nucleic acid, said process comprising the steps of:

(a) providing a nucleic acid sample containing or suspected of containing the sequence of said specific nucleic acid;

(b) contacting said sample with a mixture comprising:

(i) nucleic acid precursors,

(ii) specific polynucleotide primers comprising at least one ribonucleic acid segment, each of which primer is substantially complementary to a distinct sequence of said specific nucleic acid, and

(iii) an effective amount of a DNA polymerase; and

(iv) an effective amount of RNase H;

(c) allowing said mixture to react under isostatic conditions of temperature, buffer and ionic strength, thereby producing at least one copy of said specific nucleic acid; and

(d) removing ribonucleotides from said ribonucleic acid segment using said RNase H, to regenerate a primer binding site on said specific nucleic acid, to render said primer binding site available for another primer binding event and producing more than one ocpy of said specific nucleic acid.

144. (new) The method of claim 143, wherein said primers are DNA/RNA copolymers which comprise said RNA segment, and further comprise a DNA segment.

145. (new) The method of claim 143, wherein said primers further comprise sequences which are non-complementary to said specific nucleic acid.

146. (new) An in vitro process for producing more than one copy of a specific nucleic acid, said process comprising the steps of:

(a) providing a nucleic acid sample containing or suspected of containing the sequence of said specific nucleic acid;

(b) contacting said sample with a mixture comprising:

(i) nucleic acid precursors,

(ii) specific polynucleotide primers comprising at least one ribonucleic acid segment, each of which primer is substantially complementary to a distinct sequence of said specific nucleic acid, and

(iii) an effective amount of a reverse transcriptase;

(c) allowing said mixture to react under isostatic conditions of temperature, buffer and ionic strength, thereby producing at least one copy of said specific nucleic acid; and

(d) removing ribonucleotides from said ribonucleic acid segment using said reverse transcriptase, to regenerate a primer binding site on said specific nucleic acid, to render said primer binding site available for another primer binding event and producing more than one copy of said specific nucleic acid.

147. (new) The method of claim 146, wherein said primers are DNA/RNA copolymers which comprise said RNA segment, and further comprise a DNA segment.

148. (new) The method of claim 146, wherein said primers further comprise sequences which are non-complementary to said specific nucleic acid.